THE CITY OF SAN DIEGO

MANAGER'S REPORT

DATE ISSUED: November 25, 2002 REPORT NO. 02-287

ATTENTION: Honorable Mayor and City Council

SUBJECT: Response to Questions on Reclaimed Water raised at the July 17, 2002, Natural Resources and Culture Committee Meeting

SUMMARY

THIS IS AN INFORMATION REPORT ONLY. NO ACTION IS REQUIRED ON THE PART OF CITY COUNCIL

BACKGROUND

On July 17, 2002, Water Department staff presented the proposed Reclaimed Water Business Plan to the Natural Resources and Culture (NR&C) Committee. Following the staff presentation, NR&C Committee members requested that City staff investigate and report back on a series of questions and information requests. This report provides responses to those questions.

DISCUSSION

Questions and/or information requests made by members of the NR&C appear in bold followed by the staff response.

1. **Develop procedures/criteria to implement the Mandatory Reuse Ordinance.**

   The City Council passed the Mandatory Reuse Ordinance in August 1989. This ordinance sets a policy that reclaimed water shall be used within the City of San Diego where feasible. Municipal Code Section 64.0807(c) directs the City Manager to make a preliminary determination as to which existing potable water customers shall be converted to use reclaimed water.

   The development of procedures and criteria to implement the Mandatory Reuse Ordinance was discussed at NR&C on July 17, 2002, and will be considered by the City Council on November 26, 2002. Should the City Council support the action to implement the Ordinance, it is recommended that this matter be referred to the Public

Utilities Advisory Commission (PUAC) to oversee the development of an implementation plan. Recommendations on how to proceed will then be presented to the City Council for review and consideration.

2. Review the Water Assurance Plan and report back on how it relates to the Reclaimed Water Plan.

The City of San Diego's "Guaranteed Water" for Industry Program exempts research and development and industrial manufacturing firms from mandatory water restrictions in exchange for their participation in daily water conservation programs, including the use of reclaimed water. To qualify for the "Guaranteed Water" Program, the business must be located in an area where reclaimed water is available, use reclaimed water on its premises to the fullest extent possible, and participate in all applicable City water conservation programs. Once the company passes an inspection by the City's Water Conservation Engineer, the company is certified by the City as exempt from mandatory water supply cuts during a "water warning." Firms currently certified by the program include the R.W. Johnson Pharmaceutical Research Institute and Pharmingen Corporation.

A company certified by the "Guaranteed Water" Program may use as much as 19,602 gallons of reclaimed water per day or approximately 7 million gallons of reclaimed water per year. A company certified by this program can potentially save enough potable water to meet the needs of 50 average San Diego families per year. To participate in the City's "Guaranteed Water" Program, firms can contact the City of San Diego's Water Resources Management Program at (619) 515-3500. Three local companies have been certified for this program. Qualcomm has shown interest and has asked for a commercial water conservation survey to be conducted.

The "Guaranteed Water" Program is a component of the Business Plan as it provides an incentive to customers to use reclaimed, rather than potable water.

3. Review Pricing Alternatives to Encourage Conservation.

In 1997 the City adopted a three-tier commodity charge for single-family residences as part of its water rate structure. This tiered approach encourages conservation by charging a higher per unit price for higher levels of usage. Under the current rates, the first 7 hundred cubic feet (HCF) per month is charged at a rate of $1.338 per HCF; the second 7 HCF is charged at a rate of $1.703 per HCF; and usage above 14 HCF is charged at a rate of $1.880 per HCF. As a result, there is a financial incentive to use less water in order to avoid higher per unit charges.

Alternatives which might encourage additional conservation could include: (1) increasing the price differential between tiers; (2) adding tiers or changing the number of HCF per tier; (3) instituting seasonal rates where higher rates would be charged during peak use periods; and, (4) extending the tiered rate structure to include commercial and industrial customers in addition to residential customers.

4. Review the issue of Further Reducing the Reclaimed Water Rate.

City Council established a reclaimed water commodity rate of $0.80 per hundred cubic feet (HCF) effective July 1, 2001. This rate was a reduction from $1.34 per HCF, which had been previously established to be approximately 90% of the potable water rate. The current rate structure was intended to recover the City's operational and capital costs and serve as an incentive for customers to convert to reclaimed water usage. It also served to offset onsite retrofit costs following the conclusion of the City subsidized program. As expressed to the City Council at the time of the rate reduction, the revised lower rate was intended to be sufficient for the first four to five years, and would thereafter increase for the remainder of the 20 year study period. Specifically, the reduced rate of $0.80 per HCF would be sufficient through 2006. Thereafter, annual increases of 5-6% were anticipated.

Accordingly, further reductions in the reclaimed water rate would be largely dependent on obtaining substantial financial subsidies in order to reduce the operating and capital cost of existing as well as future infrastructure. As noted, the existing rate is dependent on covering annual bond debt service payments for existing reclaimed water facilities, as well as providing for future capital and the associated debt service cost. Therefore, only if substantial grants or other contributions could be obtained to offset these capital and operating costs could the existing rates be favorably impacted. Alternatively, any financial subsidies received could serve to reduce the extent of future rate increases. The City's current approved rate case has programmed reclaimed water capital project expenditures of $25 million in FY02-07.

Another means to potentially reduce the reclaimed water rate would be to increase the volume of reclaimed water sales. However, in order to achieve such increases, additional pipelines would need to be currently in place or constructed at no cost to the City. As also noted, the current rate model has already assumed that this infrastructure would be constructed at City or private developer's expense and allow for the increased sales volume over future years.

5. Include landscaping, water conservation, and water quality as part of the Reclaimed Water Business Plan.

Water conservation is an inherent part of the Reclaimed Water Business Plan. This is due to the rules and regulations pertaining to reclaimed water use. These requirements are outlined by the State and County Department of Health Services and by the Rules and Regulations for Reclaimed Water Use and Distribution within the City of San Diego. The requirements were created by the Health Department to prevent any scenarios where reclaimed water could become a health issue. Of the many Health Department requirements the City of San Diego enforces the most beneficial to water conservation are as follows:

1. Ponding and Runoff
2. Correct operating pressure
3. Overspray and wind blown spray, there should not be any sprinkler heads spraying directly on hardscape.
4. Irrigation system hours of operation (run times) and a color coded map of the controller stations/zones in controller cabinet.
5. Unauthorized modifications

Ponding and Runoff is not allowed at reclaimed water use sites. This conserves water by preventing wasteful practices from going unchecked. Contributors to ponding and runoff are over watering, incorrect irrigation scheduling, poor irrigation system design, overspray and broken system components. Runoff is a large contributor to storm system pollution.

Correct operating pressure is required at reclaimed water sites. Correct operating pressure prevents misting. When misting occurs water intended for the landscape is wasted in drift and is lost in evaporation. Correct operating pressure also allows system components to function within their design range and increases the life of the system.

Overspray and wind blown spray, there should not be any sprinkler heads spraying directly on hardscape. The prevention of overspray onto hardscape surfaces keeps water where it is intended on the landscape. Water is not permitted to spray on walls, sidewalks, and pavement, where it is wasted and may cause damage to these surfaces. Overspray water is a large contributor to runoff and storm water pollution.

Irrigation system hours of operation (run times) and a color coded map of the controller stations/ zones in controller cabinet. The City of San Diego Water Department only permits reclaimed water irrigation systems to run from 10:00pm to 6:00am. This prevents wasteful irrigation scheduling during the peak hours of evaporation. Maintenance personnel familiarize themselves with the site's irrigation system. They learn what zone is energized by what valve and what plant material grows in the zone. With this knowledge maintenance staff can then develop an informed irrigation schedule.

Unauthorized modifications. Reclaimed water use sites are required to have potential modifications to a reclaimed water irrigation system approved prior to implementation. This helps prevent a system that previously met the requirements from violating them in the future.

A certified reclaimed water site supervisor is required for each reclaimed site. This is an integral part of water conservation at reclaimed water sites. The property manager selects an individual of their choosing. The individual must be involved in all aspects of reclaimed water use for the site. The reclaimed water site supervisor is the site contact for city staff and an information source for the property manager. The individual typically chosen for this position is the site landscaper. To become certified the individual must attend a day-long course held by the San Diego County Water Authority. The course covers water history, treatment, health issues, and landscape issues. In the

landscape portion of this class, site supervisors are notified of the requirements and trained on how to achieve them. The landscape issues covered are reclaimed water use regulations, water conservation, irrigation system design, system maintenance and water quality.

All reclaimed water requirements must be met before a site is allowed to use reclaimed water. This causes a site irrigation system to be designed or retrofitted to conserve water. The requirements are enforced by state mandated annual inspections of reclaimed water use sites. Inspections are performed by city cross connection control staff in conjunction with the landscaper. Annual inspections are the primary reason sites conserve water. If the systems were not annually inspected and therefore not required to meet the regulations they would quickly fall into disrepair, becoming inefficient. On sites where potable water was previously used for irrigation the average annual consumption consistently decreases when the conversion to reclaimed water takes place. If the requirements for reclaimed water irrigation systems were enforced on potable water systems a decrease in consumption would most likely occur.

The Water Department is currently working with the Development Services Department to update the applicable Land Development Codes sections related to landscape irrigation to include reclaimed water. The proposed code revisions will require all new developments to prepare water management plans that detail the conservation strategies that indicate the right amount of water to be used for landscape plants, and help reduce irrigation runoff to the maximum extent possible.

The Water Department intends to present the proposed code revisions to the PUAC and the Natural Resources & Culture Committee in early 2003. The adopted codes would then help ensure the success of the Reclaimed Water Business Plan.

6. Develop and implement a reclaimed water public awareness/outreach campaign. Include the costs of implementing such a program.

A proposed draft public awareness campaign is included as Attachment 1 to this report. The Water Department anticipates bringing this proposed outreach campaign to the PUAC in early calendar year 2003, followed by presenting to the City Council for their consideration.

7. Provide Geographic Information System (GIS) overlay/environmental review on the impacts of Total Dissolved Solids in Reclaimed Water.

Discussion: Total Dissolved Solids (TDS) is a measure of water salinity, and is a naturally occurring component of water. In fresh water salinity comes from runoff and leaching of minerals in the soil. The table below shows typical TDS concentrations in various local waters.

Source	TDS (milligrams/liter)
Local Rain Runoff	450(1)
Local Drinking (Potable) Water	500(1)
San Diego Reclaimed Water	855(2)
Local Groundwater	350 to 1,800 (3)
Ocean Water	35,000

Notes: 1) City of San Diego Water Department Consumer Confidence Report-2001
2) North City Water Reclamation Plant Annual Report-2001
3) EIR for Reclaimed Water Distribution Master Plan-1995

Local landscape and irrigation customers have committed to receive reclaimed water with a TDS concentration potentially as high as 1,000 milligrams/liter. It has been shown in numerous studies that most plants respond favorably to water with TDS concentrations as high as 1,000 milligrams/liter.

As described in the answer to question #5 above, the State and County Department of Health Services have regulations prohibiting ponding and runoff at reclaimed water use sites. The City of San Diego Water Department enforces these requirements on their reclaimed water customers.

The attached Geographic Information System (GIS) map overlays the reclaimed water distribution system with Multiple Habitat Planning areas and Multiple Species Conservation Program areas (Attachment 2). As the GIS map details, there are many locations where reclaimed runoff could potentially enter sensitive areas.

Conclusion: The TDS of reclaimed water is slightly higher than naturally occurring local runoff. It is uncertain whether slightly higher TDS levels could have any impact on sensitive habitats. There are many locations where reclaimed water is used in the watershed of sensitive areas. The Water Department will continue to practice diligence in enforcing existing regulations prohibiting reclaimed water runoff.

8. Seek Federal and State funding for Reclaimed Water Projects.

Federal and State funding for reclaimed water distribution system projects remains an important pursuit for the Water Department in order to accomplish its aggressive program. Under specific legislation all or portions of certain distribution system projects are eligible for funding under defined priorities and guidelines. Over approximately the last five years, the Water Department has received in excess $4.8 million in grant proceeds for reclaimed water distribution system projects. Applications are also pending or planned for current projects with the State Water Resources Control Board and the U.S. Bureau of Reclamation for an additional $7.0 million.

The most significant portion for current and future projects is annual funding through the U.S. Bureau of Reclamation pursuant to “Title 16” of Public Law 102-575, The

Reclamation Wastewater and Groundwater Study and Facilities Act of 1992." It is anticipated that approximately $108 million will be made available to California agencies in the future that can be used to fund up to 25% of eligible project costs. Additionally, Proposition 50, which was approved earlier this month in the general election, provides an additional $100 million in matching funds for Clean Water and Water Quality purposes including reclaimed water distribution system projects.

9. Equivalent Dwelling Unit (EDU) charges should not be charged twice when a customer switches to reclaimed water.

Converting potable water users into reclaimed water users does not result in additional water capacity charges. A new connection to either the potable or reclaimed water systems results in a capacity charge of $2,500 for each equivalent dwelling unit (EDU). However, when an existing potable water user who has already established capacity in the potable water system converts to a reclaimed water connection, no additional capacity fees are charged. Only in certain circumstances where a reclaimed water connection results in a greater or additional service demand than the existing potable water service, will it result in additional capacity charges. Any additional charges being levied would then be based on a calculation of the additional EDU's being served. The Water Department is in the process of developing additional guidance for potential reclaimed water users that will clarify the circumstances surrounding such conversions from potable water usage.

10. Why we are not extending a reclaimed water pipeline to Balboa Park? What is the potential?

The reclaimed water strategy that the Water Department is pursuing, as detailed in the City Council approved Beneficial Reuse Study, is to connect large customers in proximity to the distribution lines of the water reclamation plants. This cost-effective approach is the basis for the design of our North City Reclaimed Water Master Plan area that has a number of large customers, primarily golf courses.

A preliminary engineering cost estimate was prepared to compare the cost of reclaimed water delivery (primarily pipeline design and construction) to the park's annual irrigation demand (including golf course and the San Diego Zoo). The cost/demand ratio for bringing reclaimed water to Balboa Park is estimated at 60% higher than the cost/demand ratio for the North City Master Plan area.

A more cost-effective method to provide Balboa Park with non-potable water for irrigation may be by drilling wells and using groundwater for landscape irrigation. The Water Department is currently evaluating this idea. The Water Department will continue to seek out and evaluate potential expansion of our reclaimed water with this cost/demand approach to assure the most cost effective system possible.

11. Analyze water use patterns at City parks and recommend water conservation measures.

The City of San Diego is recognized for its outstanding system of over 360 public parks, which comprise approximately 1,400 acres of irrigated turf, and an additional 30,000 acres of landscaping, open space, and park amenities. San Diego is located in a semi-arid desert region and receives an average of 10 inches of rainfall per year. It is also one of the most densely landscaped City's in the world. As a result of these factors, up to 90% of its water supply is imported at a cost of up to $444 per acre-foot (raw water). The combination of the high cost of imported water and a growing population mandates the need for effective water conservation programs.

Since 1982, the City Council has adopted and expanded San Diego's water conservation programs. In 1990, the Council provided funding to allow the Water and Park and Recreation Departments to implement the hiring of additional personnel and upgrade irrigation systems in Public Parks. The City's commitment to resource efficiency was further highlighted in 1991 when San Diego became an original signatory of the Memorandum of Understanding Regarding Urban Water Conservation in California. One of the Best Management Practices

(BMPs) outlined in this memorandum, BMP #5 for Large Landscape Conservation Programs and Incentives, provides the template for the program activities. The memorandum requires signatories to make a good faith effort to implement the BMPs and to take specific actions in order to accomplish the goal of increased resource efficiency.

The implementation of BMP #5 is a cooperative effort of the City's Park and Recreation and Water Departments, the San Diego County Water Authority (CWA), and the Metropolitan Water District (MWD) of Southern California. The Water Department provides funding for personnel and equipment upgrades, and the Park and Recreation Department implements the program with a full-time Conservation Coordinator and maintenance personnel. The CWA and MWD have contributed funding for landscape surveys. Landscape surveys assist commercial properties of greater than one acre of irrigated land by providing on-site water conservation audits and recommendations for water use optimization.

In 1993, the Water and Park and Recreation Departments signed a Memorandum of Understanding that established roles and responsibilities associated with the Water Department providing funding for park irrigation equipment. Since 1994, Metro Parks Division's expenditures for purchasing irrigation components/fixtures have been reimbursed annually to the General Fund by the Water Department. During the nine years this Memorandum of Understanding has been in effect, the total expenditures have been $3,150,000.

The items that have been purchased include:

- Replacement irrigation heads and parts to repair irrigation heads (Approximately 50% of total expenditures)
- Automatic, manual, and quick coupler valves and parts to repair valves (Approximately 30% of total expenditures)
- Irrigation controllers and parts for repairing controllers (Approximately 10% of total expenditures)
- Irrigation pipe and pipe fittings [PVC, copper, brass, and galvanized] (Approximately 10% of total expenditures)

The Park and Recreation Department has been responsible for tracking water consumption for over 1,200 metered accounts, repairing and upgrading irrigation systems for increased efficiency, conducting over 200 site audits, producing annual water use schedules for each park, requiring supervisory and maintenance personnel to attend training workshops on water conservation practices, and installing dedicated landscape meters.

One example of the program's success is Mission Bay Park, one of the City's largest parks with over 200 landscape acres. Landscape audits were conducted in all areas of the park including: inventories of the existing irrigation system; analysis of water use records; catch-can tests; summary water conservation recommendations; and, water use budgets for every sprinkler system. As a result of these activities, the systems now perform at optimum efficiency and the implementation of the water use budgets assures only the required amount of water is applied. Overall, water consumption at the park has been reduced by 20%, saving over $400,000 in water costs since 1991. The success of the conservation program in Mission Bay Park was recognized in March 1999, when the Park and Recreation and Water Departments received an award from the California Municipal Utilities Association in the category of Large Utility, Best Management Practices.

Citywide, the Park and Recreation Department has achieved a per acre reduction in landscape water use of between 10 and 20 percent since 1990, when water budgets and irrigation improvements were implemented. This is based on savings of between 400,000 and 800,000 HCF/Year over 2,000 acres of irrigated landscape, translating into savings of between 200 and 400 HCF/Acre/Year, or an annual water savings of $627,000 to $1.2 million. The range in savings is based upon variables that include yearly weather conditions, fluctuations in use for swimming pools, ponds, and lakes (e.g. Chollas Lake), and construction activities. It is estimated that, with continued conservation efforts, an additional 3-4 percent savings can be attained. More accurate estimates would be possible given better information on actual park acreage, and an increase in the number of separate irrigation meters at park facilities.

Other benefits achieved by the conservation programs include:

- Reducing runoff into the City's storm drain system;

- Increased public safety by replacing damaged equipment and keeping water off of streets and sidewalks;
- Improving the overall horticultural condition of the landscape;
- Reducing fertilizer contamination by reducing runoff and deep percolation into groundwater.

City Parks are a valuable resource to consumers in San Diego for many reasons. They provide valuable open space for recreation and leisure, social and educational opportunities and they contribute to the environmental health of the City and enhance the overall quality of life in each community. Additionally, tourism is of vital economic importance to the City, contributing a large volume of dollars to the local economy. City parks receive 62 million visitors each year. Balboa, Mission Bay, and Presidio Park are prime examples of parks which host these visitors and special events year-round. Through resource efficiency, the Program maintains these historic public places in an excellent condition.

In August 2002, the Council approved the City's new Commercial Landscape Survey Program (CLSP), which allows Water Department staff to have a greater role in implementing BMP #5 Citywide. The CLSP will continue, and improve upon, the successful conservation efforts taking place in our Parks.

Respectfully submitted,

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Approved: George I. Loveland
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GARDNER/MS/BP

Attachments: 1. Reclaimed Water Marketing/Public Awareness Campaign
2. GIS Map – Reclaimed Water Pipelines/Environmentally Sensitive Areas

Note: The attachments are not available in electronic format. Copies of the attachments are available for review in the Office of the City Clerk.